Access DB# 106894

# SEARCH REQUEST FORM

**Scientific and Technical Information Center**

Requester's Full Name: GREGG CANTELMO Examiner # : 75777 Date: 10/28/03
Art Unit: 1745 Phone Number 30 5 0635 Serial Number: 10/022,272
Mail Box and Bldg/Room Location: CP3 8E09 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

**************************************************************************************

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: ADDITIVE FOR ALAKALINE BATTERIES

Inventors (please provide full names): PAUL CHRISTIAN ; STUART DAVIS ; Tatjana Mezini

Earliest Priority Filing Date: 12/20/01

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

See Attached claims

Novelty lies in gold additive to electrode with Nickel oxyhydroxide (NiOOH) active material

2

**************************************************************************************

| **STAFF USE ONLY** | | **Type of Search** | | **Vendors and cost where applicable** | |
|---|---|---|---|---|---|
| Searcher: | EE | NA Sequence (#) | | STN | $177.24 |
| Searcher Phone #: | | AA Sequence (#) | | Dialog | |
| Searcher Location: | | Structure (#) | | Questel/Orbit | |
| Date Searcher Picked Up: | | Bibliographic | ✓ | Dr.Link | |
| Date Completed: | 10-29-03 | Litigation | | Lexis/Nexis | |
| Searcher Prep & Review Time: | 5 | Fulltext | | Sequence Systems | |
| ~~Clerical Prep Time:~~ | | Patent Family | | WWW/Internet | |
| Online Time: | 75 | Other | | Other (specify) | |

PTO-1590 (1-2000)

34. A primary alkaline battery comprising:

a cathode comprising nickel oxyhydroxide and a gold salt selected from the group consisting of gold (+3) oxide, gold (+3) sulfide, gold (+3) hydroxide, and gold (+3) acetate;

an anode comprising zinc;

a separator between the anode and the cathode; and

an alkaline electrolyte.

35. The battery of claim 34, wherein the nickel oxyhydroxide includes beta-nickel oxyhydroxide.

36. The battery of claim 34, wherein the nickel oxyhydroxide includes gamma-nickel oxyhydroxide.

37. The battery of claim 34, wherein the nickel oxyhydroxide includes a mixture of beta-nickel oxyhydroxide and gamma-nickel oxyhydroxide.

38. The battery of claim 34, wherein the nickel oxyhydroxide includes unfractured, substantially spherical particles.

39. The battery of claim 34, wherein the cathode includes between 5 ppm and 500 ppm of the gold salt.

40. A method of manufacturing an alkaline battery, comprising:

obtaining a cathode mixture comprising nickel oxyhydroxide, a gold salt, and an alkaline electrolyte; and

assembling a cathode containing the cathode mixture, an anode comprising zinc, and a separator between the cathode and the anode to form the alkaline battery.

41. The method of claim 40, further comprising mixing an aqueous alkaline solution containing the alkaline electrolyte and a gold salt with nickel oxyhydroxide to form the cathode mixture.

22. The battery of claim 1, wherein the cathode includes between 5 ppm and 500 ppm of the gold salt.

23. The battery of claim 1, wherein the cathode includes between 10 ppm and 200 ppm of the gold salt.

24. The battery of claim 1, wherein the cathode includes $NaOCl$, $K_2S_2O_8$, $Na_2S_2O_8$, $KMnO_4$, $BaMnO_4$, $BaFeO_4$, $AgMnO_4$, or $AgO$.

25. The battery of claim 1, further comprising $TeO_2$, $CaS$, or $Bi_2O_3$.

26. The battery of claim 1, further comprising zinc oxide, calcium fluoride, $NiO$, $MnO_2$, $Zn(OH)_2$, $CaO$, $Ca(OH)_2$, $CaSO_4$, $MgO$, $Mg(OH)_2$, $MgSO_4$, $Ba(OH)_2$, $BaSO_4$, $Sr(OH)_2$, $Yb_2O_3$, $Y(OH)_3$, $Er_2O_3$, $In_2O_3$, $Sb_2O_3$, $TiO_2$, $BaTiO_3$, $CaTiO_3$, $Gd_2O_3$, $Sm_2O_3$, $CeO_2$, $CdO$, $Ag_2O$, $BaO$, $CaWO_4$, $CaSi_2O_5$, or $SrTiO_3$.

27. The battery of claim 1, wherein the battery is a primary battery.

28. The battery of claim 27, further comprising a thulium salt.

29. The battery of claim 28, wherein the thulium salt includes thulium (3+) oxide or thulium (3+) sulfate.

30. The battery of claim 27, wherein the capacity loss is less than 40% after storing the battery at 60°C for 4 weeks.

31. The battery of claim 27, wherein the capacity loss is less than 30% after storing the battery at 60°C for 4 weeks.

32. The battery of claim 27, wherein the capacity loss is less than 10% after storing the battery at 60°C for 4 weeks.

33. The battery of claim 1, wherein the cathode includes a conductive carbon.

10. The battery of claim 6, wherein the anode includes a gelling agent.

11. The battery of claim 1, wherein the nickel oxyhydroxide is cobalt oxyhydroxide-modified nickel oxyhydroxide.

12. The battery of claim 11, wherein the cobalt oxyhydroxide-modified nickel oxyhydroxide has a coating of a cobalt oxyhydroxide on a surface of a nickel oxyhydroxide.

13. The battery of claim 12, wherein the coating is substantially uniform.

14. The battery of claim 11, wherein the cobalt oxyhydroxide-modified nickel oxyhydroxide is derived from nickel hydroxide coated with between 2% and 10% cobalt hydroxide by weight.

15. The battery of claim 11, wherein the cobalt oxyhydroxide-modified nickel oxyhydroxide is derived from alpha-nickel hydroxide.

16. The battery of claim 11, wherein the cobalt oxyhydroxide-modified nickel oxyhydroxide is derived from beta-nickel hydroxide.

17. The battery of claim 11, wherein the gold (+3) salt is selected from the group consisting of gold (+3) oxide, gold (+3) sulfide, gold (+3) hydroxide, and gold (+3) acetate.

18. The battery of claim 17, wherein the anode includes a gelling agent.

19. The battery of claim 1, wherein the nickel oxyhydroxide is derived from alpha-nickel hydroxide.

20. The battery of claim 1, wherein the nickel oxyhydroxide includes a dopant including aluminum, cobalt, manganese or silver.

21. The battery of claim 1, wherein the cathode includes less than about 1,000 ppm of the gold (+3) salt.

**WHAT IS CLAIMED IS:**

1. An alkaline battery comprising:
   a cathode comprising nickel oxyhydroxide and a gold salt;
   an anode comprising zinc;
   a separator between the anode and the cathode; and
   an alkaline electrolyte.

2. The battery of claim 1, wherein the nickel oxyhydroxide includes beta-nickel oxyhydroxide.

3. The battery of claim 1, wherein the nickel oxyhydroxide includes gamma-nickel oxyhydroxide.

4. The battery of claim 1, wherein the nickel oxyhydroxide includes a mixture of beta-nickel oxyhydroxide and gamma-nickel oxyhydroxide.

5. The battery of claim 1, wherein the nickel oxyhydroxide includes unfractured, substantially spherical particles.

6. The battery of claim 5, wherein the gold salt is selected from the group consisting of gold (+3) oxide, gold (+3) sulfide, gold (+3) hydroxide, and gold (+3) acetate.

7. The battery of claim 6, wherein the cathode includes between 5 ppm and 1000 ppm of the gold salt.

8. The battery of claim 6, wherein the cathode includes between 10 ppm and 200 ppm of the gold salt.

9. The battery of claim 6, wherein the cathode includes between 15 ppm and 100 ppm of the gold salt.

42. The method of claim 40, wherein the nickel oxyhydroxide includes gamma-nickel oxyhydroxide, beta-nickel oxyhydroxide or mixtures thereof.

43. The method of claim 40, wherein the nickel oxyhydroxide includes a nickel oxyhydroxide cobalt oxyhydroxide modified-nickel oxyhydroxide.

44. The method of claim 40, wherein the nickel oxyhydroxide includes unfractured, substantially spherical particles.

```
=> file reg
FILE 'REGISTRY' ENTERED AT 10:33:07 ON 29 OCT 2003
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2003 American Chemical Society (ACS)


=> display history full l1-


     FILE 'REGISTRY' ENTERED AT 08:58:30 ON 29 OCT 2003
                E NICKEL OXYHYDROXIDE/CN

     FILE 'HCA' ENTERED AT 08:59:42 ON 29 OCT 2003
L1            200 SEA NICKEL#(A)OXYHYDROXIDE#
L2            111 SEA (NICKEL#(A)OXYHYDROXIDE#)/IT

     FILE 'REGISTRY' ENTERED AT 09:03:40 ON 29 OCT 2003
L3              1 SEA 12026-04-9

     FILE 'HCA' ENTERED AT 09:07:01 ON 29 OCT 2003
L4           1424 SEA L3 OR NI(W)OH(W)O OR NIO(W)OH OR NIOOH OR NIO2H OR
                  NIHO2 OR (NICKEL# OR NI)(W)(HYDROXIDE# OR MONOHYDROXIDE#)
                  (W)OXIDE# OR (NICKEL# OR NI)(W)OXIDE#(W)(HYDROXIDE# OR
                  MONOHYDROXIDE#) OR (NICKEL# OR NI)(2A)OXYHYDROXIDE#
L5         188010 SEA BATTERY# OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?
                  OR GALVANI? OR WET OR DRY OR PRIMARY OR SECONDARY)(2A)(CE
                  LL OR CELLS) OR WETCELL? OR DRYCELL?

     FILE 'REGISTRY' ENTERED AT 09:08:16 ON 29 OCT 2003
                  E AU/ELS
L6          39987 SEA AU/ELS

     FILE 'HCA' ENTERED AT 10:16:30 ON 29 OCT 2003
L7         160362 SEA L6
L8            765 SEA L4 AND L5
L9             11 SEA L8 AND L7
L10               QUE AU OR GOLD##
L11            13 SEA L8 AND L10

     FILE 'WPIX, JAPIO' ENTERED AT 10:26:23 ON 29 OCT 2003
L12        203035 SEA BATTERY# OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?
                  OR GALVANI? OR WET OR DRY OR PRIMARY OR SECONDARY)(2A)(CE
                  LL OR CELLS) OR WETCELL? OR DRYCELL?
L13        115580 SEA BATTERY# OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?
                  OR GALVANI? OR WET OR DRY OR PRIMARY OR SECONDARY)(2A)(CE
                  LL OR CELLS) OR WETCELL? OR DRYCELL?
     TOTAL FOR ALL FILES
L14        318615 SEA L5
L15           175 SEA L3 OR NI(W)OH(W)O OR NIO(W)OH OR NIOOH OR NIO2H OR
                  NIHO2 OR (NICKEL# OR NI)(W)(HYDROXIDE# OR MONOHYDROXIDE#)
                  (W)OXIDE# OR (NICKEL# OR NI)(W)OXIDE#(W)(HYDROXIDE# OR
```

```
                MONOHYDROXIDE#) OR (NICKEL# OR NI)(2A)OXYHYDROXIDE#
L16         219 SEA L3 OR NI(W)OH(W)O OR NIO(W)OH OR NIOOH OR NIO2H OR
                NIHO2 OR (NICKEL# OR NI)(W)(HYDROXIDE# OR MONOHYDROXIDE#)
                (W)OXIDE# OR (NICKEL# OR NI)(W)OXIDE#(W)(HYDROXIDE# OR
                MONOHYDROXIDE#) OR (NICKEL# OR NI)(2A)OXYHYDROXIDE#
     TOTAL FOR ALL FILES
L17         394 SEA L4
L18       86531 SEA AU OR GOLD##
L19       31474 SEA AU OR GOLD##
     TOTAL FOR ALL FILES
L20      118005 SEA AU OR GOLD##
L21           3 SEA L12 AND L15 AND L18
L22           1 SEA L13 AND L16 AND L19
     TOTAL FOR ALL FILES
L23           4 SEA L14 AND L17 AND L20

     FILE 'HCA' ENTERED AT 10:27:58 ON 29 OCT 2003
L24          13 SEA L9 OR L11


=> file japio
FILE 'JAPIO' ENTERED AT 10:33:36 ON 29 OCT 2003
COPYRIGHT (C) 2003 Japanese Patent Office (JPO)- JAPIO

FILE LAST UPDATED: 17 OCT 2003       <20031017/UP>
FILE COVERS APR 1973 TO JUNE 27, 2003


=> d l22 1 ibib abs ind

L22  ANSWER 1 OF 1  JAPIO  (C) 2003 JPO  on STN
ACCESSION NUMBER:         1986-135054    JAPIO
TITLE:                    MANUFACTURE OF NICKEL ELECTRODE FOR ALKALINE
                          SECONDARY BATTERY
INVENTOR:                 KOTANI NOBORU; MIAMA NAONOBU; TSURUTA KANEHIRO;
                          SHIMIZU AKIO
PATENT ASSIGNEE(S):       HITACHI MAXELL LTD
PATENT INFORMATION:

     PATENT NO       KIND   DATE        ERA     MAIN IPC
     -----------------------------------------------------
     JP 61135054      A     19860623    Showa   H01M004-26

APPLICATION INFORMATION
     STN FORMAT:          JP 1984-257160        19841204
     ORIGINAL:            JP59257160            Showa
PRIORITY APPLN. INFO.:    JP 1984-257160      19841204
SOURCE:                   PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined
                          Applications, Vol. 1986
AN   1986-135054    JAPIO
AB   PURPOSE: To prevent falling off of the active substance, by filling
     up paste type active substance into a porous electrode base plate,
```

drying up, and then forming a vacuum evaporated membrane of a
conductive material thereover, in order to make a nickel electrode
for an alkaline secondary **battery**.
CONSTITUTION: A paste type composite made of mainly active agent
such as nickel hydroxide, or **nickel oxyhydroxide**
is spread on or filled in a porous electrode plate made of a nickel
foaming body and a sinter of a metallic fiber chop, etc., dried up,
and then a vacuum evaporated membrane of a conductor such as
**gold**, silver, or nickel is formed thereover, to make up a
nickel electrode 3. Then they are combined with the paste type
composite of cadmium oxide in the core, a separator 2, etc., to form
an alkaline secondary **battery**. Therefore, falling off of
the active substance can be prevented without reducing the reaction
surface area by the vacuum evaporated membrane, resulting in an
improvement of cycle property.

IC ICM H01M004-26

=> file wpix
FILE 'WPIX' ENTERED AT 10:33:57 ON 29 OCT 2003


FILE LAST UPDATED: 27 OCT 2003 <20031027/UP>
MOST RECENT DERWENT UPDATE: 200369 <200369/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

=> d l21 1-3 max

L21 ANSWER 1 OF 3 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-533196 [50] WPIX
DNN N2003-422972 DNC C2003-144250
TI Alkaline **battery** comprises cathode, anode, separator, and
alkaline electrolyte.
DC ~~L03~~ X16
IN CHRISTIAN, P A; DAVIS, S M; MEZINI, T
PA (CHRI-I) CHRISTIAN P A; (DAVI-I) DAVIS S M; (MEZI-I) MEZINI T;
~~(GILL) GILLETTE CO~~

Applicant

CYC 102
PI WO 2003054988 A2 20030703 (200350)* EN 26p H01M004-52
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE
LS LU MC MW MZ NL OA PT SD SE SI SK SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ
DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP
KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ
NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ
UA UG US UZ VC VN YU ZA ZM ZW
US 2003134199 A1 20030717 (200354) H01M004-62
ADT WO 2003054988 A2 WO 2002-US39649 20021211; US 2003134199 A1 US
2001-~~22272 20~~011220
PRAI US 2001-22272 20011220

Instant Application

IC ICM H01M004-52; H01M004-62
AB WO2003054988 A UPAB: 20030805
NOVELTY - An alkaline **battery** (10) comprises a cathode (12), an anode (14), a separator (16) between anode and cathode, and an alkaline electrolyte. The cathode comprises **nickel oxyhydroxide** and **gold** salt. The anode comprises zinc.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for a method of manufacturing an alkaline **battery** comprising obtaining a cathode mixture, and assembling a cathode containing the mixture, an anode, and a separator to form the alkaline **battery**.

USE - None given.

ADVANTAGE - The **battery** has excellent capacity retention during storage, e.g. at high temperature. It also exhibits excellent high power performance.

DESCRIPTION OF DRAWING(S) - The figure shows the cross-sectional view of the **battery**.

Alkaline **battery** 10
Cathode 12
Anode 14
Separator 16
Housing 18
Current collector 20
Seal 22
Top cap 24
Dwg.1/2

TECH WO 2003054988 A2UPTX: 20030805
TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Materials: The **nickel oxyhydroxide** is a beta-**nickel oxyhydroxide** and/or gamma-**nickel oxyhydroxide**. The **nickel oxyhydroxide** can also be cobalt **oxyhydroxide**-modified **nickel oxyhydroxide**. The **nickel oxyhydroxide** includes unfractured, spherical particles. The **gold** salt is **gold** (+3) oxide, **gold** (+3) sulfide, **gold** (+3) hydroxide or **gold** (+3) acetate. The cathode contains **gold** salt (5-1000, preferably 15-100 parts per million (ppm)). The anode is a gelling agent. The cobalt **oxyhydroxide**-modified **nickel oxyhydroxide** has a uniform coating of a cobalt **oxyhydroxide** on **nickel oxyhydroxide** surface. The cobalt **oxyhydroxide**-modified **nickel oxyhydroxide** is derived from nickel hydroxide coated with 2-10 % cobalt hydroxide. The cobalt **oxyhydroxide**-modified **nickel oxyhydroxide** can also be derived from beta or alpha-nickel hydroxide.

The cathode is sodium oxychloride, dipotassium disulfur octaoxide, disodium disulfur octaoxide, potassium permanganate, barium permanganate, barium ferrous oxide, silver manganate, or silver oxide. The **battery** also comprises zinc oxide, calcium fluoride, nickel oxide, manganese oxide, zinc hydroxide, calcium

oxide, calcium hydroxide, calcium sulfate, magnesium sulfate, barium hydroxide, barium sulfate, strontium hydroxide, ytterbium oxide, ytterbium hydroxide, erbium oxide, indium oxide, antimony oxide, titanium oxide, barium titanite, calcium titanite, gadolinium oxide, samarium oxide, cesium oxide, cadmium oxide, silver oxide, barium oxide, calcium-tungsten tetraoxide, calcium silicon oxide, or strontium titanite.
The **battery** also comprises thulium salt including thulium oxide or thulium sulfate.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Materials: The cathode includes a conductive carbon.

TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Properties: The **battery** has a capacity loss of less than 40, preferably 10% after storing the **battery** for 4 weeks at 60 degreesC.

FS CPI EPI
FA AB; GI
MC CPI: L03-E01B4; L03-E01B6
EPI: X16-B01A; X16-E01; X16-E01C1

L21 ANSWER 2 OF 3 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1999-540689 [45] WPIX
DNN N1999-400749 DNC C1999-157934
TI Ion conductive matrixes for forming membranes, composite electrode, **electrochemical cell**, fuel **cell** and water electrolizer.
DC A32 A85 E16 E36 E37 J03 L03 P56 X16
IN DUVDEVANI, T; MELMAN, A; PELED, E
PA (UYRA-N) UNIV RAMOT APPLIED RES & IND DEV LTD
CYC 84
PI WO 9944245 A1 19990902 (199945)* EN 35p H01M004-58
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW
AU 9926369 A 19990915 (200004) H01M004-58
EP 1066656 A1 20010110 (200103) EN H01M004-58
R: DE ES FR GB IT NL SE
IL 123419 A 20001206 (200103) H01M004-58
IL 126830 A 20010520 (200153) H01M004-58
KR 2001034536 A 20010425 (200164) H01M004-58
JP 2002505506 W 20020219 (200216) 41p H01M008-02
ADT WO 9944245 A1 WO 1999-IL109 19990222; AU 9926369 A AU 1999-26369 19990222; EP 1066656 A1 EP 1999-906424 19990222, WO 1999-IL109 19990222; IL 123419 A IL 1998-123419 19980224; IL 126830 A IL 1998-126830 19981030; KR 2001034536 A KR 2000-709294 20000823; JP 2002505506 W WO 1999-IL109 19990222, JP 2000-533910 19990222
FDT AU 9926369 A Based on WO 9944245; EP 1066656 A1 Based on WO 9944245;

JP 2002505506 W Based on WO 9944245
PRAI IL 1998-126830 19981030; IL 1998-123419 19980224
IC ICM H01M004-58; H01M008-02
ICS B01D071-02; B23P019-00; C08J005-20; C25B009-00; C25B011-04; C25B013-00; H01B001-06; H01M004-32; H01M004-34; H01M004-42; H01M004-50; H01M004-62; H01M004-86; H01M006-00; H01M006-04; H01M006-14; H01M006-16
ICA H01M006-18
AB WO 9944245 A UPAB: 19991103
NOVELTY - The ion conductive matrix comprises 5 - 60 volume percent (vol.%) of inorganic powder in form of sub-micron particles having good aqueous electrolyte absorption capacity, 5 - 50 vol.% of polymeric binder compatible with an aqueous electrolyte, and 10 - 90 vol.% of an aqueous electrolyte.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(i) Method for casting membrane which comprises preparing mixture comprising inorganic powder, polymeric binder, at least one high boiling point solvent with boiling point above 100 deg. C and at least one low boiling point solvent in which the polymeric binder is soluble or forms a gel at casting temperature. Film is casted out of mixture and low boiling point solvent is evaporated from mixture to form solid film. Solid film is washed to replace high boiling point solvent with aqueous electrolyte solution. Alternatively, mixture is heated to its softening temperature and film is formed by hot extrusion of softened mixture. The high boiling point solvent used in the mixture has boiling point above 90 deg. C. Film is cooled to obtain solid film, and washed to replace solvent with aqueous electrolyte solution.

(ii) Method for casting composite electrode comprising steps involved in casting membrane. Alternatively, preparing composite electrode by extrusion which comprises steps involved in preparing membrane by extrusion.

USE - For forming membranes, composite electrode, **electrochemical cell**, fuel **cell** and water electrolizer.

ADVANTAGE - Novel, low cost and highly conductive ion conducting matrix, membranes and electrodes are provided. The ion conducting membranes have good porosity and mechanical properties. Internal lubricants with low solubility in water is used to achieve solubility factor not higher than 14 (cal/cc)1/2, thereby preventing the migration of internal lubricants out of ion conductive membranes when they come in contact with water at washing phase or acid loading phase.

Dwg.0/2

TECH WO 9944245 A1 UPTX: 19991103
TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Matrix: The ion conducting matrix is a proton conducting matrix and comprises desirably 5 - 50 % of inorganic powder such as silicon dioxide ($SiO_2$), zirconium oxide ($ZrO_2$), boron trioxide ($B_2O_3$), titanium oxide ($TiO_2$), aluminum oxide ($Al_2O_3$), and/or optional hydroxides or oxy-hydroxides of Ti, Al, B or Zr with a surface area of at least 10

m2/g. The matrix optionally comprises 0.1 - 25 % of nonvolatile liquid lubricant which is compatible with all the components in matrix.
Preferred Electrolyte: The aqueous electrolyte consists of aqueous soluble salt and/or base which is used in aqueous solution having molar concentration of 0.1 - 10 M, preferably 1 - 5 M.
Alkali metal salts, alkali earth metal salts, R4NX, where
R = organic radical;
X = anion derived from an inorganic acid.
Ammonium chloride (NH4Cl) and/or zinc chloride (ZnCl2) is used as the aqueous soluble salt.
R4NOH, where
R = hydrogen or an organic radical, alkali and/or alkali earth base compound is used as the aqueous soluble bases.
Preferred Membrane: The membrane comprises ion conducting matrix having electronically nonconductive inorganic material with particle size less than 150 nm. The membrane comprises pores with size less than 50 nm. The inorganic powder of matrix is treated with acid or base prior to preparation of membrane. The membrane further comprises electronic nonconductive reinforcing element.
Preferred Electrode: The composite electrode comprises 10 - 70 vol.% of the matrix and remaining electrode material.
Preferred **Electrochemical Cell**: The **electrochemical cell** comprises membrane or at least one electrode having electrode material of carbon and/or graphite, metal oxides such as RuO2, WOx or MnO2. Cadmium, zinc, and/or aluminum or its alloys is used as anode active material. Manganese oxide (MnO2), silver oxide or nickel oxy hydroxide ( **NiOOH**) is used as cathode active material. Zn or Al anode and oxygen or air electrode which consists of double layer film with hydrophobic air side and hydrophilic ionic membrane side is used. The air electrode catalyst is compatible with aqueous solutions of ionic conductive membrane such as oxides of platinum, palladium, **gold**, silver, copper, manganese, tungsten and/or metal-porphyrin complexes of their salts. The **electrochemical cell** is single structure unit manufactured by hot pressing the electrodes on both sides of the membrane.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Lubricant: Diesters of aliphatic or aromatic dibasic acids, esters of phosphoric acids, hydrocarbons or synthetic hydrocarbons, silicone oils and/or fluorocarbons is used as the lubricant.
Preferred Acid: The proton conducting matrix comprises 10 - 90 vol.% of an acid such as CF3(CF2)nSO3H, HO3S(CF2)nSO3H, where
n = 0 - 9, especially 0 - 4.
sulfuric acid, hydrochloric acid, hydrobromic acid, phosphoric acid and/or nitric acid. The acid is used in an aqueous solution having a molar concentration of 10 - 99 %, preferably 25 - 99 %.
Preferred Solvent: The high boiling point solvent used for casting or preparing membrane or composite electrode is water soluble solvent. Propylene carbonate, ethylene carbonate, dimethyl

phthalate, diethyl phthalate, and/or dibutyl phthalate is used as high boiling point solvent for casting or preparing membrane. Tetrahydrofuran, dimethylether (DME), cyclopentanone, acetone, N-methyl pyrrolidone, dimethylacetamide, methylethylketone, and/or dimethyl-formamide is used as the low boiling point solvent for casting or preparing the membrane. Propylene carbonate, diethyl carbonate, dimethyl carbonate, butyrolactone, methyl isoamyl ketone, cyclohexanone, dialkyl phthalate, and/or glycerol triacetate is used as solvent for casting or preparing composite electrode.

TECHNOLOGY FOCUS - POLYMERS - Preferred Binder: Polyvinylidene fluoride, polyvinylidene fluoridehexafluoropropylene, poly(tetrafluoroethylene), poly(methylmethacrylate), polysulfone amide, poly(acrylamide), polyvinyl chloride, poly(acrylonitrile), and/or polyvinyl fluoride is used as the polymeric binder.

ABEX WO 9944245 A1 UPTX: 19991103
EXAMPLE - The membrane film was manufactured by mixing 0.17 g (24.5 vol.%) of powdered Kynar PVDF 2801-00, 99.8 % (0.5 vol.%) of silicon (IV) oxide with 0.147 g and particle size of 400 m2/g, 20 ml of cyclopentanone and 0.48 ml of propylene carbonate (PC) to obtain viscous mixture. The viscous mixture was poured onto Teflon plate and dried at room temperature for 24 hours to obtain transparent film. The film was washed with double distilled water to remove PC and was found to have porosity of 75 vol.%. The ion conductive membrane was found to have very good mechanical properties.

KW [1] 686-0-0-0 CL; 694-0-0-0 CL; 157006-0-0-0 CL; 107016-0-0-0 CL; 104494-0-0-0 CL; 104379-0-0-0 CL; 92-0-0-0 CL; 104432-0-0-0 CL; 125155-0-0-0 CL; 80-0-0-0 CL; 63-0-0-0 CL; 62-0-0-0 CL; 9-0-0-0 CL; 7-0-0-0 CL; 72-0-0-0 CL; 66-0-0-0 CL; 232118-0-0-0 CL; 232117-0-0-0 CL; 67557-0-0-0 CL; 232116-0-0-0 CL; 299-0-0-0 CL; 232115-0-0-0 CL; 232114-0-0-0 CL; 232113-0-0-0 CL; 232112-0-0-0 CL; 0006-87604 CL; 0006-87603 CL; 0006-87602 CL; 0006-87601 CL; 217-0-0-0 CL PRD; 97153-0-0-0 CL PRD; 3-0-0-0 CL

FS CPI EPI GMPI

FA AB; DCN

MC CPI: A09-A03; A12-E06B; A12-E09; A12-E14; E10-A09B8; E10-A22G; E31-A02; E31-B03C; E31-B03D; E31-D01; E31-F05; E31-H05; E31-K05A; E31-P03; E32-A04; E33; E34; E35; J03-A; L03-A02; L03-E01B9; L03-E04B
EPI: X16-A; X16-A02; X16-E01C; X16-E01C1; X16-E05; X16-E06; X16-E09

DRN 1498-U; 1532-P; 1532-U; 1544-U; 1704-U; 1711-U; 1714-U; 1724-U; 1740-S; 1740-U; 1779-P; 1779-U; 1889-U; 1947-U; 1966-U

PLE UPA 19991103

L21 ANSWER 3 OF 3 WPIX 

AN 1976-88587X [47] WPIX

TI Sealed rechargeable nickel hydrogen **battery** - contg. at least two cells and having inherent overcharge and overdischarge protection.

DC L03 X16

PA (TYCO) TYCO LAB INC

CYC 1
PI US 3990910 A 19761109 (197647)*
PRAI US 1972-258151 19720531
IC H01M010-34
AB US 3990910 A UPAB: 19930901
A rechargeable **battery** comprises (a) at least two Ni/H2 cells, each comprising (i) >=1 positive **NiOOH** electrode, (ii) >=1 negative electrode comprising a conductive support and a catalyst capable of dissociating H2 to H from Pt, Pd, Raney Ni, Rh, Nb, Ag, **Au**, Ru, Ir, Os, alloys and oxides, (iii) porous separators between electrodes and (iv) an aq. alkaline electrolyte in separator pores, (b) conductors connecting the cells in series, (c) a hermetically sealed case contg. the cells and preventing gas inflow and outflow on charge and discharge and (d) an H2 supply in the case surrounding the electrodes and separators. The **battery** operates over a wide range of ambient temps. without gas addn., has inherent overcharge or -discharge protection and its charge state can be determined by gas press.

added to (-) electrode Not NiOOH

FS CPI EPI
FA AB
MC CPI: L03-E03

=> file hca
FILE 'HCA' ENTERED AT 10:34:39 ON 29 OCT 2003
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.


=> d l24 1-13 cbib abs it

L24 ANSWER 1 OF 13 HCA COPYRIGHT 2003 ACS on STN

WO US03 06460
US APP 10/086807

139:248042 Preparation of **nickel oxide hydroxide** by ozonization and its use as cathode material in **batteries**. Christian, Paul A.; Mezini, Tatjana (The Gilette Company, USA). PCT Int. Appl. WO 2003076339 A1 20030918, 27 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US6460 20030304. PRIORITY: US 2002-86807 20020304.

AB **Nickel oxide hydroxide** is prepd. by Y M D exposing an agitated and heated mixt. of a nickel hydroxide and a alkali metal hydroxide salt to humidified ozone. The nickel hydroxide can be .alpha.- or .beta.-nickel hydroxide, or cobalt hydroxide-coated .alpha.- or .beta.-nickel hydroxide. The product

obtained can be .beta.- or .gamma.-**nickel oxyhydroxide**, or cobalt oxyhydroxide-coated .gamma.- or .beta.-**nickel oxyhydroxide**. The staring materials are mixed in an inert atm. which is substantially free of $CO_2$ and water. The alkali metal hydroxide can be KOH, NaOH, or LiOH and it can include silver hydroxide or **gold** hydroxide. The mixt. can contain an oxidn.-promoting additive, such as Ag, silver oxide, **Au**, **gold** oxide, **gold** hydroxide, potassium peroxide, potassium superoxide, potassium permanganate, or silver permanganate. The nickel hydroxide can be doped with Al, Co, Ga, In, or Bi. The **nickel oxyhydroxide** is suitable as cathode material of a **battery**. The cathode can contain an oxidizing additive, such as NaOCl, sodium peroxydisulfate, potassium peroxydisulfate, $KMnO_4$, $Ba(MnO_4)_2$, barium ferrate, silver permanganate, $Ag_2O$, or AgO. The **battery** has an anode made of Zn and an electrolyte contg. KOH, NaOH, or LiOH. The **battery** has a capacity loss after storage for 4 wk at 60.degree.C of < 30%.

to electrolyte

not electrode

IT Secondary **batteries**
(button-type; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT **Battery** cathodes
Electric capacitance
Ozonization
(prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 7440-66-6, Zinc, uses
(anode material; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 55070-72-9P, **Nickel oxide hydroxide**
(cathode material, optionally doped or coated; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 1310-65-2, Lithium hydroxide (LiOH)
(electrolyte; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 1310-58-3, Potassium hydroxide (KOH), uses 1310-73-2, Sodium hydroxide (NaOH), uses
(electrolyte; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 12672-51-4, Cobalt hydroxide
(nickel hydroxide coated with; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 7429-90-5, Aluminum, uses 7440-48-4, Cobalt, uses 7440-55-3, Gallium, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses
(nickel hydroxide doped with; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode

material in **batteries**)

IT 12016-80-7P, Cobalt oxide hydroxide
(**nickel oxide hydroxide** coated with, cathode material; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 7440-22-4, Silver, uses
(oxidn. promoter; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 1301-96-8, Silver oxide (AgO) **7440-57-5**, **Gold**, uses 7681-52-9, Sodium hypochlorite 7722-64-7, Potassium permanganate 7727-21-1, Potassium peroxydisulfate 7775-27-1, Sodium peroxydisulfate 7783-98-4, Silver permanganate 7787-36-2, Barium manganate (Ba(MnO4)2) 11138-11-7, Barium iron oxide 12030-88-5, Potassium superoxide 12673-77-7, Silver hydroxide 17014-71-0, Potassium peroxide 20667-12-3, Silver oxide **39403-39-9**, **Gold** oxide **54182-83-1**, **Gold** hydroxide
(prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 10028-15-6, Ozone, reactions 12054-48-7, Nickel hydroxide
(prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

L24 ANSWER 2 OF 13 HCA COPYRIGHT 2003 ACS on STN

139:71602 Additive for alkaline **batteries**. Christian, Paul A.; Davis, Stuart M.; Mezini, Tatjana (The Gillette Company, USA). PCT Int. Appl. WO 2003054988 A2 20030703, 26 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION $\boxed{\text{WO 2002-US39649}}$ 20021211. PRIORITY: US 2001-22272 20011220.

AB An alk. **battery** includes a cathode including **Ni oxyhydroxide** and a **gold** salt, an anode including zinc, a separator between the cathode and the anode, and an alk. electrolyte. The **Ni oxyhydroxide** includes .beta.- and .gamma.-**Ni oxyhydroxide**. **Gold** salt is selected from **Au**(III) oxide, **Au**(III) hydroxide, and **Au**(III) acetate.

IT **Battery** cathodes
Primary **batteries**
(additive for alk. **batteries**)

IT Primary **batteries**
(button-type; additive for alk. **batteries**)

IT 11113-74-9, Nickel hydroxide

Instead Application

(additive for alk. **batteries**)
IT 7440-66-6, Zinc, uses 55070-72-9, **Nickel hydroxide oxide**
(additive for alk. **batteries**)
IT 1301-96-8, Silver oxide Ago **1303-52-2**, **Gold** hydroxide **au**(oh)3 **1303-58-8**, **Gold** oxide au2o3 **1303-61-3**, **Gold** sulfide au2s3 1304-28-5, Barium oxide (BaO), uses 1304-76-3, Bismuth oxide (Bi2O3), uses 1305-62-0, Calcium hydroxide, uses 1305-78-8, Calcia, uses 1306-19-0, Cadmium oxide (CdO), uses 1306-38-3, Cerium oxide ceo2, uses 1309-42-8, Magnesium hydroxide 1309-48-4, Magnesium oxide (MgO), uses 1309-64-4, Antimony oxide (Sb2O3), uses 1312-43-2, India 1313-13-9, Manganese dioxide, uses 1313-99-1, Nickel oxide (NiO), uses 1314-13-2, Zinc oxide, uses 1314-37-0, Ytterbia **7440-57-5D**, **Gold**, salt 7446-07-3, Tellurium oxide (TeO2) 7487-88-9, Magnesium sulfate, uses 7681-52-9, Sodium hypochlorite Naocl 7722-64-7, Potassium permanganate 7727-21-1, Potassium persulfate 7727-43-7, Barium sulfate 7775-27-1, Sodium persulfate 7778-18-9, Calcium sulfate 7783-98-4, Silver permanganate 7787-36-2, Barium permanganate 7789-75-5, Calcium fluoride, uses 7790-75-2, Calcium tungsten oxide cawo4 12036-44-1, Thulium oxide 12047-27-7, Barium titanium oxide batio3, uses 12049-50-2, Calcium titanium oxide catio3 12060-58-1, Samaria 12060-59-2, Strontium titanium oxide srtio3 12061-16-4, Erbia 12064-62-9, Gadolinia 12672-51-4, Cobalt hydroxide 13463-67-7, Titania, uses 13773-23-4, Barium iron oxide bafeo4 14857-02-4, Calcium silicate casi2o5 16469-22-0, Yttrium hydroxide 17194-00-2, Barium hydroxide 18480-07-4, Strontium hydroxide 20427-58-1, Zinc hydroxide 20548-54-3, Calcium sulfide (CaS) 20667-12-3, Silver oxide (Ag2O) 20731-62-8, Thulium sulfate **51305-35-2**, **Gold** acetate 61701-27-7, Cobalt hydroxide oxide
(additive for alk. **batteries**)
IT 7440-44-0, Carbon, uses
(conductive; additive for alk. **batteries**)
IT 7429-90-5, Aluminum, uses 7439-96-5, Manganese, uses 7440-22-4, Silver, uses 7440-48-4, Cobalt, uses
(dopant; additive for alk. **batteries**)

L24 ANSWER 3 OF 13 HCA COPYRIGHT 2003 ACS on STN
136:11815 Dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency. Farley, N. R. S.; Gurman, S. J.; Hillman, A. R. (Department of Physics, University of Leicester, Leicester, LE1 7RH, UK). Electrochimica Acta, 46(20-21), 3119-3127 (English) 2001. CODEN: ELCAAV. ISSN: 0013-4686. Publisher: Elsevier Science Ltd..
AB A dynamic in situ x-ray absorption study, in the energy dispersive mode, revealed short-range structural changes taking place during the discharge of a nickel hydroxide film electrode. A Jahn-Teller distortion was identified in the 1st Ni-O shell at overcharge, which diminishes during the discharge process. Throughout discharge, the 1st Ni-Ni shell moves antagonistically to Ni-O coordination. These

structural changes and Ni K-edge shifts were used as measures of Ni valency during film discharge. Correlation of the results with electrode charge leads to a simple mechanism, in terms of electron population at Ni sites, for the discharge process.

IT Electrodeposits
(cyclic voltammetry of nickel electrodeposited film on **gold** in KOH soln. and dynamic ~~EXAFS~~ study of discharging nickel hydroxide electrode with non-integer Ni valency)

grid

IT **Battery** electrodes
Electrodes
(dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

IT Oxidation, electrochemical
(in charging nickel hydroxide electrode)

IT EXAFS spectra
Electric charge
Reduction, electrochemical
(in discharging nickel hydroxide electrode with non-integer Ni valency)

IT Bond length
(nickel-nickel; in discharging nickel hydroxide electrode with non-integer Ni valency)

IT Bond length
(nickel-oxygen; in discharging nickel hydroxide electrode with non-integer Ni valency)

IT Cyclic voltammetry
(of nickel electrodeposited film on **gold** in KOH soln. and dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

IT 1310-58-3, Potassium hydroxide (KOH), uses
(cyclic voltammetry of nickel electrodeposited film on **gold** in KOH soln. and dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

IT **7440-57-5**, **Gold**, uses
(cyclic voltammetry of nickel electrodeposited film on **gold** in KOH soln. and dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

IT 7440-02-0, Nickel, uses
(dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

IT 11113-74-9P, Nickel hydroxide **12026-04-9P**, **Nickel hydroxide oxide** (**Ni**(**OH**)
**O**) 12054-48-7P, Nickel hydroxide (Ni(OH)2)
(dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

L24 ANSWER 4 OF 13 HCA COPYRIGHT 2003 ACS on STN
133:352547 Stable cycling behavior of the light invariant AlGaAs/Si/metal hydride solar cell. Wang, B.; Licht, S.; Soga, T.; Umeno, M. (Department of Chemistry, Technion - Israel Institute of Technology, Haifa, 32000, Israel). Solar Energy Materials and Solar Cells, 64(4), 311-320 (English) 2000. CODEN: SEMCEQ. ISSN:

0927-0248. Publisher: Elsevier Science B.V..

AB The extended stability (eight month) of an unusual solar cell which provides a nearly const. energetic output in illuminated or dark conditions is demonstrated. Bipolar multiple bandgap semiconductors are selected to provide a high photopotential and efficient conversion of insolation. A redox couple is chosen with an electrochem. potential closely matched to the photopotential, and provides efficient high-capacity electrochem. storage. The single cell combines bipolar AlGaAs (Eg=1.6 eV) and Si (Eg=1.0 eV) and metal hydride/**NiOOH** storage, and generates a light variation insensitive potential of 1.2-1.3 V at an overall solar conversion efficiency of 18.2%. The cell generates power under illumination, and in the dark stored energy is spontaneously (without external switching) released.

IT Secondary **batteries**
Solar cells
(stable cycling behavior of light invariant AlGaAs/Si/metal hydride solar cell)

IT 7440-36-0, Antimony, uses **7440-57-5**, **Gold**, uses
7440-66-6, Zinc, uses 187086-23-3, Aluminum gallium arsenide
(stable cycling behavior of light invariant AlGaAs/Si/metal hydride solar cell)

IT 1314-98-3, Zinc sulfide, uses 7440-21-3, Silicon, uses
7783-40-6, Magnesium fluoride
(stable cycling behavior of light invariant AlGaAs/Si/metal hydride solar cell)

L24 ANSWER 5 OF 13 HCA COPYRIGHT 2003 ACS on STN

131:172705 Ion conductive matrixes and their use in electrochemical devices. Peled, Emanuel; Duvdevani, Tair; Melman, Avi (Ramot University Authority for Applied Research & Industrial Development, Israel). PCT Int. Appl. WO 9944245 A1 19990902, 35 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1999-IL109 19990222. PRIORITY: IL 1998-123419 19980224; IL 1998-126830 19981030.

Not electrode

AB The present invention provides an ion conducting matrix comprising: (i) 5 to 60% by vol. of an inorg. powder having a good aq. electrolyte absorption capacity, (ii) 5 to 50% by vol. of a polymeric binder that is chem. compatible with an aq. electrolyte, and (iii) 10 to 90% by vol. of an aq. electrolyte, wherein the inorg. powder comprises essentially sub-micron particles. The present invention further provides a membrane being a film made of the matrix of the invention and a composite electrode comprising 10 to 70% by vol. of the matrix of the invention.

IT Primary **batteries**
(Zn-air; ion conductive matrixes and their use in electrochem.

devices)
IT Carboxylic acids, uses
(aliph., esters, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Carboxylic acids, uses
(arom., esters, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Fluoropolymers, uses
(binder; ion conductive matrixes and their use in electrochem. devices)
IT Carboxylic acids, uses
(dicarboxylic, aliph., esters, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Carboxylic acids, uses
(dicarboxylic, aryl, esters, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Capacitors
(double layer; ion conductive matrixes and their use in electrochem. devices)
IT Hydrocarbons, uses
(fluoro, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Fuel cells
Membranes, nonbiological
(ion conductive matrixes and their use in electrochem. devices)
IT Metalloporphyrins
Oxides (inorganic), uses
(ion conductive matrixes and their use in electrochem. devices)
IT Lubricants
(liq.; ion conductive matrixes and their use in electrochem. devices)
IT Hydrocarbons, uses
Polysiloxanes, uses
(lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Polysulfones, uses
Polysulfones, uses
(polyamide-, binder; ion conductive matrixes and their use in electrochem. devices)
IT Binders
(polymer; ion conductive matrixes and their use in electrochem. devices)
IT Polyamides, uses
Polyamides, uses
(polysulfone-, binder; ion conductive matrixes and their use in electrochem. devices)
IT **Electrolytic cells**
(water; ion conductive matrixes and their use in electrochem. devices)
IT 7429-90-5, Aluminum, uses 7440-43-9, Cadmium, uses 7440-66-6, Zinc, uses
(anodes; ion conductive matrixes and their use in electrochem.

devices)
IT 9002-84-0 9002-86-2, Pvc 9003-05-8, Polyacrylamide 9011-14-7, Pmma 9011-17-0, Polyvinylidene fluoride hexafluoropropylene 24937-79-9 24981-14-4, Polyvinyl fluoride 25014-41-9, Polyacrylonitrile
(binder; ion conductive matrixes and their use in electrochem. devices)
IT 1313-13-9, Manganese dioxide, uses 20667-12-3, Silver oxide 55070-72-9, **Nickel hydroxide oxide**
(cathodes; ion conductive matrixes and their use in electrochem. devices)
IT 1314-35-8, Tungsten oxide, uses 12036-10-1, Ruthenium dioxide
(electrode; ion conductive matrixes and their use in electrochem. devices)
IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
(electrodes; ion conductive matrixes and their use in electrochem. devices)
IT 7439-96-5, Manganese, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-33-7, Tungsten, uses 7440-50-8, Copper, uses **7440-57-5**, **Gold**, uses
(ion conductive matrixes and their use in electrochem. devices)
IT 354-88-1, Ethanesulfonic acid, pentafluoro- 375-73-5, Nonafluorobutanesulfonic acid 423-41-6 1493-13-6 2706-91-4, 1-Pentanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,5-undecafluoro- 14970-71-9, Dithionic acid 40856-11-9 41062-44-6 56344-03-7 82727-18-2
(ion conductive matrixes and their use in electrochem. devices)
IT 1303-86-2, Boron oxide b2o3, uses 1314-23-4, Zirconia, uses 1344-28-1, Aluminum oxide (Al2O3), uses 7631-86-9, Silica, uses 13463-67-7, Titania, uses
(ion conductive matrixes and their use in electrochem. devices)
IT 10043-35-3, Boric acid (H3BO3), uses 12651-23-9, Titanium hydroxide 12713-25-6, Zirconium hydroxide oxide 12738-89-5, Titanium hydroxide oxide 14475-63-9, Zirconium hydroxide 21645-51-2, Aluminum hydroxide, uses 24623-77-6, Aluminum hydroxide oxide
(ion conductive matrixes and their use in electrochem. devices)
IT 67-64-1, 2-Propanone, uses 68-12-2, uses 78-93-3, Ethyl methyl ketone, uses 84-66-2, Diethyl phthalate 84-74-2, Dibutyl phthalate 96-48-0 96-49-1, Ethylene carbonate 102-76-1, Glycerol triacetate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-94-1, Cyclohexanone, uses 109-99-9, uses 110-12-3, Isoamyl methyl ketone 110-71-4 120-92-3, Cyclopentanone 127-19-5, Dimethyl acetamide 131-11-3, Dimethyl phthalate 616-38-6, Dimethyl carbonate 872-50-4, n-Methylpyrrolidone, uses
(ion conductive matrixes and their use in electrochem. devices)
IT 124-18-5, Decane 238407-65-3, Yivac 06/6
(lubricant; ion conductive matrixes and their use in electrochem. devices)
IT 7664-38-2D, Phosphoric acid, ester, uses
(lubricants; ion conductive matrixes and their use in

electrochem. devices)

L24 ANSWER 6 OF 13 HCA COPYRIGHT 2003 ACS on STN
130:239975 Nickel cathode for secondary alkaline **battery**.
Kato, Hitoshi (Furukawa Battery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11086852 A2 19990330 Heisei, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-256064 19970904.

AB The cathode contains .gamma.-**NiOOH** particles coated with .gtoreq.1 elec. conductive metal. Alternatively, the cathode contg. .gamma.-**NiOOH** particles is coated with .gtoreq.1 elec. conductive metal. The **battery** having the Ni cathode is also claimed. The **battery** has high discharge capacity, good capacity retention, and long cycle life.

IT **Battery** cathodes
(cathode contg. .gamma.-**NiOOH** particles coated with elec. conductive metal for alk. **battery** for discharge capacity)

IT Coating materials
(elec. conductive; cathode contg. .gamma.-**NiOOH** particles coated with elec. conductive metal for alk. **battery** for discharge capacity)

IT 7440-22-4, Silver, uses 7440-50-8, Copper, uses **12026-04-9**, **Nickel hydroxide oxide** (**NiOOH**)
(cathode contg. .gamma.-**NiOOH** particles coated with elec. conductive metal for alk. **battery** for discharge capacity)

IT 7439-88-5, Iridium, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-36-0, Antimony, uses 7440-48-4, Cobalt, uses **7440-57-5**, **Gold**, uses 7440-66-6, Zinc, uses 7440-74-6, Indium, uses 11101-13-6
(.gamma.-**NiOOH** particle-contg. cathode coated with elec. conductive metal for alk. **battery** for discharge capacity)

L24 ANSWER 7 OF 13 HCA COPYRIGHT 2003 ACS on STN
130:156030 Electrochemical behavior of nickel deposited on reticulated vitreous carbon. Czerwinski, A.; Dmochowska, M.; Grden, M.; Kopczyk, M.; Wojcik, G.; Mlynarek, G.; Kolata, J.; Skowronski, J. M. (Department of Chemistry, The University of Warsaw, Warsaw, 02-093, Pol.). Journal of Power Sources, 77(1), 28-33 (English) 1999. CODEN: JPSODZ. ISSN: 0378-7753. Publisher: Elsevier Science S.A..

AB The electrochem. performance of nickel deposited on reticulated vitreous carbon (RVC) has been investigated in solns. of KOH. For comparison, the study of sintered nickel and nickel deposited on **gold** wire behavior were also included. The results indicate that the RVC covered with nickel is a good carrier for Ni(OH)2/ **NiOOH** electrode material used in rechargeable **batteries**. Ni/RVC satd. with Ni(OH)2 shows behavior similar or even better than that of sintered Ni satd. with Ni(OH)2.

X

gold grid

IT **Battery** cathodes
(electrochem. behavior of nickel deposited on reticulated vitreous carbon for use as cathode in **batteries**)
IT 7440-02-0, Nickel, uses
(electrochem. behavior of nickel deposited on reticulated vitreous carbon for use as cathode in **batteries**)
IT 1310-58-3, Potassium hydroxide, uses
(electrolyte; electrochem. behavior of nickel deposited on reticulated vitreous carbon for use as cathode in **batteries**)
IT 7440-44-0, Carbon, uses
(reticulated vitreous; electrochem. behavior of nickel deposited on reticulated vitreous carbon for use as cathode in **batteries**)

L24 ANSWER 8 OF 13 HCA 
129:167240 Thermodynamic considerations of the reversible potential for the nickel electrode. Jain, Mukul; Elmore, Amanda L.; Matthews, Michael A.; Weidner, John W. (Dep. Chem. Eng., Swearingen Eng. Center, Univ. South Carolina, Columbia, SC, 29208, USA). Electrochimica Acta, 43(18), 2649-2660 (English) 1998. CODEN: ELCAAV. ISSN: 0013-4686. Publisher: Elsevier Science Ltd..
AB The thermodn. of ideal and non-ideal solns. is applied to nickel hydroxide, the electrochem. active material in the pos. electrode of a nickel **battery**, to provide theor. insight into the reversible potential as a function of the state-of-discharge. The models were fit to exptl. discharge curves to obtain the activity-coeff. parameters and the std. potential over a temp. range from 5 to 55.degree.. The two-parameter activity coeff. models perform significantly better than the protons into the lattice occurs in an ordered, non-random fashion. The std. potential decreases linearly with temp. by 0.84 mV/K. The thermodn. expressions and parameters given here enable one to predict the reversible potential of nickel hydroxide as a function of temp. and state-of-discharge.
IT Electric charge
(exptl. and model discharge curves for nickel hydroxide over temp. range from 5 to 550)
IT Cyclic voltammetry
(of nickel hydroxide electrode in KOH electrolyte)
IT Films
(of nickel hydroxide electrodeposition on **gold** substrate) (grid) X
IT Thermodynamics
(of reversible potential for nickel electrode)
IT Activity (thermodynamic)
Electric potential
Redox reaction
Simulation and Modeling, physicochemical
Standard potential
(thermodn. considerations of reversible potential for nickel electrode)

IT Secondary **batteries**
(thermodn. considerations of reversible potential for nickel electrode in)
IT 1310-58-3, Potassium hydroxide, properties
(charge-discharge of nickel hydroxide film in soln. of)
IT 21041-93-0, Cobalt hydroxide (Co(OH)2)
(copptn. of, in nickel hydroxide **battery** electrode)
IT 12054-48-7, Nickel hydroxide 55070-72-9, **Nickel hydroxide oxide**
(electrode; reversible potential and thermodn. considerations)
IT 10141-05-6, Cobalt nitrate
(electrolytic bath for nickel film deposition contg.)
IT 64-17-5, Ethanol, uses 7631-99-4, Sodium nitrate, uses
(electrolytic bath for nickel hydroxide film deposition contg.)
IT **7440-57-5**, **Gold**, uses
(substrate for nickel hydroxide electrochem. deposition)
IT 7440-02-0, Nickel, uses
(thermodn. considerations of reversible potential for nickel electrode)

L24 ANSWER 9 OF 13 HCA COPYRIGHT 2003 ACS on STN
117:11406 Studies on the self-discharge mechanism of nickel/hydrogen cells. Lim, Hong S.; Rogers, Howard H.; Losee, David B. (Ind. Electron. Group, Hughes Aircr. Co., Torrance, CA, 90509-2999, USA). Proceedings - Electrochemical Society, 92-5(Proc. Symp. Hydrogen Storage Mater., Batteries, Electrochem., 1991), 333-43 (English) 1992. CODEN: PESODO. ISSN: 0161-6374.
AB The self-discharge of Ni/H **batteries** involves either a direct chem. reaction between charged active material and H or the electrochem. oxidn. of H at the surface of **NiOOH** active material. The H oxidn. rate at **NiOOH** is partially limited by diffusion. The use of porous Ni or **Au** electrode did not promote self-discharge. The H pressure changes obsd. under open-circuit storage conditions were much smaller than the obsd. self-discharge current and, in some cases, the direction of current changes was not the same as that of pressure changes; this observation rules out the direct reaction of H as the cause for self-discharge. grid X
IT **Batteries**, secondary
(nickel-hydrogen, self-discharge mechanism of)
IT **12026-04-9**, **Nickel hydroxide oxide** (**NiOOH**)
(oxidn. at, of hydrogen, nickel-hydrogen **battery** self-discharge due to)
IT 1333-74-0, Hydrogen, reactions
(oxidn. of, at **nickel hydroxide oxide** active material, nickel-hydrogen **battery** self-discharge due to)

L24 ANSWER 10 OF 13 HCA COPYRIGHT 2003 ACS on STN
112:187861 Hydrogen oxidation on nickel electrodes in alkaline media. Zhang, C.; White, R. E.; Kim, J. B.; Appleby, A. J.; Srinivasan, S.

(Dep. Chem. Eng., Texas A and M Univ., College Station, TX, 77843-3122, USA). Proceedings - Electrochemical Society, 90-4(Proc. Symp. Nickel Hydroxide Electrodes, 1989), 356-67 (English) 1990. CODEN: PESODO. ISSN: 0161-6374.

AB Hydrogen oxidn. on Pt, **Au** and Ni in alk. media was studied using cyclic voltammetry, rotating disk electrode and potentiostatic techniques, in an effort to understand the self-discharge mechanism of the Ni/H2 **battery**. The Ni substrate was found to be the most effective in inhibiting hydrogen oxidn. The anodically formed **nickel** hydroxide/**oxyhydroxide** film exhibits a better inhibiting character than that cathodically formed in respect to hydrogen oxidn., and it may play an important role in minimizing self-discharge.

IT Oxidation, electrochemical
(of hydrogen, on nickel, passivation effect on)

IT Oxidation catalysts
(electrochem., neg., **nickel oxyhydroxide**, for hydrogen)

IT Passivation
(electrochem., of nickel, hydrogen oxidn. in relation to)

IT **7440-57-5**, **Gold**, uses and miscellaneous
(electrode, hydrogen oxidn. on, in alk. medium)

IT 7440-02-0, Nickel, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous
(electrode, hydrogen oxidn. on, passivation effect on)

IT **12026-04-9**, **Nickel hydroxide oxide** (**Ni**(**OH**)**O**) 12054-48-7, Nickel dihydroxide
(nickel electrode coated with, hydrogen oxidn. on)

IT 1333-74-0, Hydrogen, reactions
(oxidn. of, electrochem., on **gold** or nickel or platinum)

L24 ANSWER 11 OF 13 HCA COPYRIGHT 2003 ACS on STN

98:37599 Cathodic hydrogen gas production through palladium alloy membrane electrodes. Shirogami, T.; Murata, K. (Toshiba Res. Dev. Cent., Kawasaki, Japan). International Journal of Hydrogen Energy, 7(11), 877-82 (English) 1982. CODEN: IJHEDX. ISSN: 0360-3199.

AB A H-permeable membrane electrode-H-**NiOOH** rechargeable **battery** was tested and the performance of the cathodic H prodn. through the membrane electrode was investigated. A Pd-13.4 Ag-20% **Au** [**39285-07-9**] alloy membrane electrode, whose 1 surface was covered with Pd-Pt black catalyst and the other with Pd black, was used to make 1 of the walls of the H-contg. vessel. When the Pd-Pt catalyzed electrolyte-facing surface is cathodically polarized in concd. KOH solns., H atoms dissolve in the membrane by penetrating it and leave the other palladized surface as free H, which passes into the gas chamber. The effects of electrode potential, H pressure in the gas chamber, membrane thickness, electrolyte concn., and temp. on the H prodn. rate and yield into the gas chamber were investigated and a refined anal. of the the phenomena was carried out.

IT **Batteries**, secondary
(nickel-hydrogen, performance of)
IT Electrodes
(**battery**, catalytic, membrane, **gold**
-palladium-silver alloy, performance of hydrogen)
IT 1333-74-0, uses and miscellaneous
(electrodes, **battery**, **gold**-palladium-silver
alloy membrane, performance of catalytic)
IT **39285-07-9**
(electrodes, catalytic membrane, **battery**, performance
of hydrogen)

L24 ANSWER 12 OF 13 HCA COPYRIGHT 2003 ACS on STN
95:118372 Cathodic hydrogen gas production through palladium alloy membrane electrodes. Shirogami, T.; Murata, K. (Toshiba Res. Dev. Cent., Kawasaki, Japan). Advances in Hydrogen Energy, 2(Hydrogen Energy Prog., Vol. 4), 2055-65 (English) 1981. CODEN: AHENDB. ISSN: 0276-2412.
AB A H-**Ni**(**OH**)**O** secondary **battery** having a H-permeable membrane anode was tested and performance of the anode was investigated. The Pd-13.4 Ag-20% **Au** alloy [**39285-07-9**] anode, whose 1 surface was covered with Pd-Pt black catalyst and the other with Pd black, was used to make a wall of a H-contg. vessel. When the Pd-Pt catalyzed electrolyte-facing surface is polarized in concd. KOH, H is yielded into the chamber through the dissolved H atoms penetrating the membrane and leaving at the other palladized surface as H. Effects of electrode potential, H pressure in the gas chamber, membrane thickness, electrolyte concn., and exptl. temp. on H prodn. rate and yield efficiency were investigated and analyzed.
IT **Batteries**, secondary
(hydrogen-**nickel hydroxide oxide**,
performance of)
IT Anodes
(**battery**, hydrogen-permeable **gold**
-palladium-silver alloy, performance of)
IT 1333-74-0, uses and miscellaneous
(anodes from **gold**-palladium-silver alloy permeable by,
**battery**, performance of)
IT **39285-07-9**
(anodes from hydrogen-permeable, **battery**, performance
of)

L24 ANSWER 13 OF 13 HCA COPYRIGHT 2003 ACS on STN
93:242748 Nickel-oxide electrode structure. Oswin, Harry G. (USA). U.S. US 4224392 19800923, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1977-861421 19771216.
AB Ni oxide electrode structures esp. suitable for use in mobile energy-storage applications comprise a highly porous C matrix having electrochem. active **Ni**(**OH**)**O** deposited within and in elec. contact with the matrix sandwiched between 2 thin rigid Mg supports. The surface of the support in contact with

the matrix can be coated with a metal such as **Au** to provide elec. cond. The elec~~trodes are economically~~ manufd. to provide a thick electrode having high porosity and large pore size while maintaining structural strength and stability, and including a large amt. of active mass.

IT Electrodes
(**battery**, **nickel hydroxide oxide**, of high capacity and strength)

IT **7440-57-5**, uses and miscellaneous
(electrodes contg. coating of, **nickel hydroxide oxide battery**, of high capcity and strength)

IT 7440-44-0, uses and miscellaneous
(electrodes contg. matrix of, **nickel hydroxide oxide battery**, of high capacity and strength)

IT 7439-95-4, uses and miscellaneous
(electrodes contg. supports of, **nickel hydroxide oxide battery**, of high capacity and strength)

IT **12026-04-9**
(electrodes, **battery**, of high capacity and strength)

=> d l24 1-13 cbib abs hitstr it

L24 ANSWER 1 OF 13 HCA COPYRIGHT 2003 ACS on STN

139:248042 Preparation of **nickel oxide hydroxide** by ozonization and its use as cathode material in **batteries**. Christian, Paul A.; Mezini, Tatjana (The Gilette Company, USA). PCT Int. Appl. WO 2003076339 A1 20030918, 27 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US6460 20030304. PRIORITY: US 2002-86807 20020304.

AB **Nickel oxide hydroxide** is prepd. by exposing an agitated and heated mixt. of a nickel hydroxide and a alkali metal hydroxide salt to humidified ozone. The nickel hydroxide can be .alpha.- or .beta.-nickel hydroxide, or cobalt hydroxide-coated .alpha.- or .beta.-nickel hydroxide. The product obtained can be .beta.- or .gamma.-**nickel oxyhydroxide**, or cobalt oxyhydroxide-coated .gamma.- or .beta.-**nickel oxyhydroxide**. The staring materials are mixed in an inert atm. which is substantially free of CO2 and water. The alkali metal hydroxide can be KOH, NaOH, or LiOH and it can include silver hydroxide or **gold** hydroxide. The mixt. can contain an oxidn.-promoting additive, such as Ag, silver oxide, **Au**, **gold** oxide, **gold**

electrolyte has gold additive

hydroxide, potassium peroxide, potassium superoxide, potassium permanganate, or silver permanganate. The nickel hydroxide can be doped with Al, Co, Ga, In, or Bi. The **nickel oxyhydroxide** is suitable as cathode material of a **battery**. The cathode can contain an oxidizing additive, such as NaOCl, sodium peroxydisulfate, potassium peroxydisulfate, KMnO4, Ba(MnO4)2, barium ferrate, silver permanganate, Ag2O, or AgO. The **battery** has an anode made of Zn and an electrolyte contg. KOH, NaOH, or LiOH. The **battery** has a capacity loss after storage for 4 wk at 60.degree.C of < 30%.

IT **7440-57-5**, **Gold**, uses **39403-39-9**, **Gold** oxide **54182-83-1**, **Gold** hydroxide
(prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

RN 39403-39-9 HCA

CN Gold oxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | x | 17778-80-2 |
| Au | x | 7440-57-5 |

RN 54182-83-1 HCA

CN Gold hydroxide (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| HO | x | 14280-30-9 |
| Au | x | 7440-57-5 |

IT Secondary **batteries**
(button-type; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT **Battery** cathodes
Electric capacitance
Ozonization
(prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 7440-66-6, Zinc, uses
(anode material; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 55070-72-9P, **Nickel oxide hydroxide**

(cathode material, optionally doped or coated; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 1310-65-2, Lithium hydroxide (LiOH)
(electrolyte; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 1310-58-3, Potassium hydroxide (KOH), uses 1310-73-2, Sodium hydroxide (NaOH), uses
(electrolyte; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 12672-51-4, Cobalt hydroxide
(nickel hydroxide coated with; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 7429-90-5, Aluminum, uses 7440-48-4, Cobalt, uses 7440-55-3, Gallium, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses
(nickel hydroxide doped with; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 12016-80-7P, Cobalt oxide hydroxide
(**nickel oxide hydroxide** coated with, cathode material; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 7440-22-4, Silver, uses
(oxidn. promoter; prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 1301-96-8, Silver oxide (AgO) **7440-57-5**, **Gold**, uses 7681-52-9, Sodium hypochlorite 7722-64-7, Potassium permanganate 7727-21-1, Potassium peroxydisulfate 7775-27-1, Sodium peroxydisulfate 7783-98-4, Silver permanganate 7787-36-2, Barium manganate (Ba(MnO4)2) 11138-11-7, Barium iron oxide 12030-88-5, Potassium superoxide 12673-77-7, Silver hydroxide 17014-71-0, Potassium peroxide 20667-12-3, Silver oxide **39403-39-9**, **Gold** oxide **54182-83-1**, **Gold** hydroxide
(prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

IT 10028-15-6, Ozone, reactions 12054-48-7, Nickel hydroxide
(prepn. of **nickel oxyhydroxide** by ozonization and its use as cathode material in **batteries**)

L24 ANSWER 2 OF 13 HCA COPYRIGHT 2003 ACS on STN
139:71602 Additive for alkaline **batteries**. Christian, Paul A.; Davis, Stuart M.; Mezini, Tatjana (The Gillette Company, USA). PCT Int. Appl. ~~WO 2~~003054988~~ A2 20~~030703, 26 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,

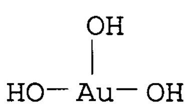
Claims priority to Instant App

LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-US39649 20021211. PRIORITY: US 2001-22272 20011220.

AB An alk. **battery** includes a cathode including **Ni oxyhydroxide** and a **gold** salt, an anode including zinc, a separator between the cathode and the anode, and an alk. electrolyte. The **Ni oxyhydroxide** includes .beta.- and .gamma.-**Ni oxyhydroxide**. **Gold** salt is selected from **Au**(III) oxide, **Au**(III) hydroxide, and **Au**(III) acetate.

IT **1303-52-2**, **Gold** hydroxide **au**(oh)3 **1303-58-8**, **Gold** oxide au2o3 **1303-61-3**, **Gold** sulfide au2s3 **7440-57-5D**, **Gold**, salt **51305-35-2**, **Gold** acetate
(additive for alk. **batteries**)

RN 1303-52-2 HCA
CN Gold hydroxide (Au(OH)3) (6CI, 8CI, 9CI) (CA INDEX NAME)




RN 1303-58-8 HCA
CN Gold oxide (Au2O3) (6CI, 8CI, 9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|---|---|---|
| O | 3 | 17778-80-2 |
| Au | 2 | 7440-57-5 |

RN 1303-61-3 HCA
CN Gold sulfide (Au2S3) (6CI, 8CI, 9CI) (CA INDEX NAME)

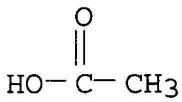
| Component | Ratio | Component Registry Number |
|---|---|---|
| S | 3 | 7704-34-9 |
| Au | 2 | 7440-57-5 |

RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

RN 51305-35-2 HCA

CN Acetic acid, gold salt (9CI) (CA INDEX NAME)



x Au(x)

IT **Battery** cathodes
Primary **batteries**
(additive for alk. **batteries**)
IT Primary **batteries**
(button-type; additive for alk. **batteries**)
IT 11113-74-9, Nickel hydroxide
(additive for alk. **batteries**)
IT 7440-66-6, Zinc, uses 55070-72-9, **Nickel hydroxide oxide**
(additive for alk. **batteries**)
IT 1301-96-8, Silver oxide Ago **1303-52-2**, **Gold** hydroxide **au**(oh)3 **1303-58-8**, **Gold** oxide au2o3 **1303-61-3**, **Gold** sulfide au2s3 1304-28-5, Barium oxide (BaO), uses 1304-76-3, Bismuth oxide (Bi2O3), uses 1305-62-0, Calcium hydroxide, uses 1305-78-8, Calcia, uses 1306-19-0, Cadmium oxide (CdO), uses 1306-38-3, Cerium oxide ceo2, uses 1309-42-8, Magnesium hydroxide 1309-48-4, Magnesium oxide (MgO), uses 1309-64-4, Antimony oxide (Sb2O3), uses 1312-43-2, India 1313-13-9, Manganese dioxide, uses 1313-99-1, Nickel oxide (NiO), uses 1314-13-2, Zinc oxide, uses 1314-37-0, Ytterbia **7440-57-5D**, **Gold**, salt 7446-07-3, Tellurium oxide (TeO2) 7487-88-9, Magnesium sulfate, uses 7681-52-9, Sodium hypochlorite Naocl 7722-64-7, Potassium permanganate 7727-21-1, Potassium persulfate 7727-43-7, Barium sulfate 7775-27-1, Sodium persulfate 7778-18-9, Calcium sulfate 7783-98-4, Silver permanganate 7787-36-2, Barium permanganate 7789-75-5, Calcium fluoride, uses 7790-75-2, Calcium tungsten oxide cawo4 12036-44-1, Thulium oxide 12047-27-7, Barium titanium oxide batio3, uses 12049-50-2, Calcium titanium oxide catio3 12060-58-1, Samaria 12060-59-2, Strontium titanium oxide srtio3 12061-16-4, Erbia 12064-62-9, Gadolinia 12672-51-4, Cobalt hydroxide 13463-67-7, Titania, uses 13773-23-4, Barium iron oxide bafeo4 14857-02-4, Calcium silicate casi2o5 16469-22-0, Yttrium hydroxide 17194-00-2, Barium hydroxide 18480-07-4, Strontium hydroxide 20427-58-1, Zinc hydroxide 20548-54-3, Calcium sulfide (CaS) 20667-12-3, Silver oxide (Ag2O) 20731-62-8, Thulium sulfate **51305-35-2**, **Gold** acetate 61701-27-7, Cobalt hydroxide oxide
(additive for alk. **batteries**)
IT 7440-44-0, Carbon, uses

(conductive; additive for alk. **batteries**)

IT 7429-90-5, Aluminum, uses 7439-96-5, Manganese, uses 7440-22-4, Silver, uses 7440-48-4, Cobalt, uses
(dopant; additive for alk. **batteries**)

L24 ANSWER 3 OF 13 HCA COPYRIGHT 2003 ACS on STN

136:11815 Dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency. Farley, N. R. S.; Gurman, S. J.; Hillman, A. R. (Department of Physics, University of Leicester, Leicester, LE1 7RH, UK). Electrochimica Acta, 46(20-21), 3119-3127 (English) 2001. CODEN: ELCAAV. ISSN: 0013-4686. Publisher: Elsevier Science Ltd..

AB A dynamic in situ x-ray absorption study, in the energy dispersive mode, revealed short-range structural changes taking place during the discharge of a nickel hydroxide film electrode. A Jahn-Teller distortion was identified in the 1st Ni-O shell at overcharge, which diminishes during the discharge process. Throughout discharge, the 1st Ni-Ni shell moves antagonistically to Ni-O coordination. These structural changes and Ni K-edge shifts were used as measures of Ni valency during film discharge. Correlation of the results with electrode charge leads to a simple mechanism, in terms of electron population at Ni sites, for the discharge process.

IT **7440-57-5**, **Gold**, uses
(cyclic voltammetry of nickel electrodeposited film on **gold** in KOH soln. and dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Electrolyte

Au

IT **12026-04-9P**, **Nickel hydroxide oxide** (**Ni**(**OH**)**O**)
(dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

RN 12026-04-9 HCA

CN Nickel hydroxide oxide (Ni(OH)O) (9CI) (CA INDEX NAME)

HO—Ni═O

IT Electrodeposits
(cyclic voltammetry of nickel electrodeposited film on electrolyte **gold** in KOH soln. and dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

IT **Battery** electrodes
Electrodes
(dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

IT Oxidation, electrochemical
(in charging nickel hydroxide electrode)

IT EXAFS spectra
Electric charge
Reduction, electrochemical
(in discharging nickel hydroxide electrode with non-integer Ni valency)
IT Bond length
(nickel-nickel; in discharging nickel hydroxide electrode with non-integer Ni valency)
IT Bond length
(nickel-oxygen; in discharging nickel hydroxide electrode with non-integer Ni valency)
IT Cyclic voltammetry
(of nickel electrodeposited film on **gold** in KOH soln. and dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)
IT 1310-58-3, Potassium hydroxide (KOH), uses
(cyclic voltammetry of nickel electrodeposited film on **gold** in KOH soln. and dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)
IT **7440-57-5, Gold**, uses
(cyclic voltammetry of nickel electrodeposited film on **gold** in KOH soln. and dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)
IT 7440-02-0, Nickel, uses
(dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)
IT 11113-74-9P, Nickel hydroxide **12026-04-9P, Nickel hydroxide oxide** (**Ni(OH)**
**O**) 12054-48-7P, Nickel hydroxide (Ni(OH)2)
(dynamic EXAFS study of discharging nickel hydroxide electrode with non-integer Ni valency)

L24 ANSWER 4 OF 13 HCA COPYRIGHT 2003 ACS on STN
133:352547 Stable cycling behavior of the light invariant AlGaAs/Si/metal hydride solar cell. Wang, B.; Licht, S.; Soga, T.; Umeno, M. (Department of Chemistry, Technion - Israel Institute of Technology, Haifa, 32000, Israel). Solar Energy Materials and Solar Cells, 64(4), 311-320 (English) 2000. CODEN: SEMCEQ. ISSN: 0927-0248. Publisher: Elsevier Science B.V..
AB The extended stability (eight month) of an unusual solar cell which provides a nearly const. energetic output in illuminated or dark conditions is demonstrated. Bipolar multiple bandgap semiconductors are selected to provide a high photopotential and efficient conversion of insolation. A redox couple is chosen with an electrochem. potential closely matched to the photopotential, and provides efficient high-capacity electrochem. storage. The single cell combines bipolar AlGaAs (Eg=1.6 eV) and Si (Eg=1.0 eV) and metal hydride/**NiOOH** storage, and generates a light variation insensitive potential of 1.2-1.3 V at an overall solar conversion efficiency of 18.2%. The cell generates power under illumination, and in the dark stored energy is spontaneously (without external switching) released.

IT **7440-57-5**, **Gold**, uses
(stable cycling behavior of light invariant AlGaAs/Si/metal hydride solar cell)
RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT Secondary **batteries**
Solar cells
(stable cycling behavior of light invariant AlGaAs/Si/metal hydride solar cell)
IT 7440-36-0, Antimony, uses **7440-57-5**, **Gold**, uses
7440-66-6, Zinc, uses 187086-23-3, Aluminum gallium arsenide
(stable cycling behavior of light invariant AlGaAs/Si/metal hydride solar cell)
IT 1314-98-3, Zinc sulfide, uses 7440-21-3, Silicon, uses
7783-40-6, Magnesium fluoride
(stable cycling behavior of light invariant AlGaAs/Si/metal hydride solar cell)

L24 ANSWER 5 OF 13 HCA 
131:172705 Ion conductive matrixes and their use in electrochemical devices. Peled, Emanuel; Duvdevani, Tair; Melman, Avi (Ramot University Authority for Applied Research & Industrial Development, Israel). PCT Int. Appl. WO 9944245 A1 19990902, 35 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1999-IL109 19990222. PRIORITY: IL 1998-123419 19980224; IL 1998-126830 19981030.
AB The present invention provides an ion conducting matrix comprising: (i) 5 to 60% by vol. of an inorg. powder having a good aq. electrolyte absorption capacity, (ii) 5 to 50% by vol. of a polymeric binder that is chem. compatible with an aq. electrolyte, and (iii) 10 to 90% by vol. of an aq. electrolyte, wherein the inorg. powder comprises essentially sub-micron particles. The present invention further provides a membrane being a film made of the matrix of the invention and a composite electrode comprising 10 to 70% by vol. of the matrix of the invention.
IT **7440-57-5**, **Gold**, uses
(ion conductive matrixes and their use in electrochem. devices)
RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT Primary **batteries**
 (Zn-air; ion conductive matrixes and their use in electrochem. devices)
IT Carboxylic acids, uses
 (aliph., esters, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Carboxylic acids, uses
 (arom., esters, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Fluoropolymers, uses
 (binder; ion conductive matrixes and their use in electrochem. devices)
IT Carboxylic acids, uses
 (dicarboxylic, aliph., esters, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Carboxylic acids, uses
 (dicarboxylic, aryl, esters, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Capacitors
 (double layer; ion conductive matrixes and their use in electrochem. devices)
IT Hydrocarbons, uses
 (fluoro, lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Fuel cells
 Membranes, nonbiological
 (ion conductive matrixes and their use in electrochem. devices)
IT Metalloporphyrins
 Oxides (inorganic), uses
 (ion conductive matrixes and their use in electrochem. devices)
IT Lubricants
 (liq.; ion conductive matrixes and their use in electrochem. devices)
IT Hydrocarbons, uses
 Polysiloxanes, uses
 (lubricants; ion conductive matrixes and their use in electrochem. devices)
IT Polysulfones, uses
 Polysulfones, uses
 (polyamide-, binder; ion conductive matrixes and their use in electrochem. devices)
IT Binders
 (polymer; ion conductive matrixes and their use in electrochem. devices)
IT Polyamides, uses
 Polyamides, uses
 (polysulfone-, binder; ion conductive matrixes and their use in electrochem. devices)
IT **Electrolytic cells**
 (water; ion conductive matrixes and their use in electrochem. devices)

IT 7429-90-5, Aluminum, uses 7440-43-9, Cadmium, uses 7440-66-6, Zinc, uses
(anodes; ion conductive matrixes and their use in electrochem. devices)

IT 9002-84-0 9002-86-2, Pvc 9003-05-8, Polyacrylamide 9011-14-7, Pmma 9011-17-0, Polyvinylidene fluoride hexafluoropropylene 24937-79-9 24981-14-4, Polyvinyl fluoride 25014-41-9, Polyacrylonitrile
(binder; ion conductive matrixes and their use in electrochem. devices)

IT 1313-13-9, Manganese dioxide, uses 20667-12-3, Silver oxide 55070-72-9, **Nickel hydroxide oxide**
(cathodes; ion conductive matrixes and their use in electrochem. devices)

IT 1314-35-8, Tungsten oxide, uses 12036-10-1, Ruthenium dioxide
(electrode; ion conductive matrixes and their use in electrochem. devices)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
(electrodes; ion conductive matrixes and their use in electrochem. devices)

IT 7439-96-5, Manganese, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-33-7, Tungsten, uses 7440-50-8, Copper, uses **7440-57-5**, **Gold**, uses
(ion conductive matrixes and their use in electrochem. devices)

IT 354-88-1, Ethanesulfonic acid, pentafluoro- 375-73-5, Nonafluorobutanesulfonic acid 423-41-6 1493-13-6 2706-91-4, 1-Pentanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,5-undecafluoro- 14970-71-9, Dithionic acid 40856-11-9 41062-44-6 56344-03-7 82727-18-2
(ion conductive matrixes and their use in electrochem. devices)

IT 1303-86-2, Boron oxide b2o3, uses 1314-23-4, Zirconia, uses 1344-28-1, Aluminum oxide (Al2O3), uses 7631-86-9, Silica, uses 13463-67-7, Titania, uses
(ion conductive matrixes and their use in electrochem. devices)

IT 10043-35-3, Boric acid (H3BO3), uses 12651-23-9, Titanium hydroxide 12713-25-6, Zirconium hydroxide oxide 12738-89-5, Titanium hydroxide oxide 14475-63-9, Zirconium hydroxide 21645-51-2, Aluminum hydroxide, uses 24623-77-6, Aluminum hydroxide oxide
(ion conductive matrixes and their use in electrochem. devices)

IT 67-64-1, 2-Propanone, uses 68-12-2, uses 78-93-3, Ethyl methyl ketone, uses 84-66-2, Diethyl phthalate 84-74-2, Dibutyl phthalate 96-48-0 96-49-1, Ethylene carbonate 102-76-1, Glycerol triacetate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-94-1, Cyclohexanone, uses 109-99-9, uses 110-12-3, Isoamyl methyl ketone 110-71-4 120-92-3, Cyclopentanone 127-19-5, Dimethyl acetamide 131-11-3, Dimethyl phthalate 616-38-6, Dimethyl carbonate 872-50-4, n-Methylpyrrolidone, uses
(ion conductive matrixes and their use in electrochem. devices)

IT 124-18-5, Decane 238407-65-3, Yivac 06/6
(lubricant; ion conductive matrixes and their use in electrochem.

devices)
IT 7664-38-2D, Phosphoric acid, ester, uses
(lubricants; ion conductive matrixes and their use in electrochem. devices)

L24 ANSWER 6 OF 13 HCA COPYRIGHT 2003 ACS on STN
130:239975 Nickel cathode for secondary alkaline **battery**.
Kato, Hitoshi (Furukawa Battery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11086852 A2 19990330 Heisei, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-256064 19970904.
AB The cathode contains .gamma.-**NiOOH** particles coated with .gtoreq.1 elec. conductive metal. Alternatively, the cathode contg. .gamma.-**NiOOH** particles is coated with .gtoreq.1 elec. conductive metal. The **battery** having the Ni cathode is also claimed. The **battery** has high discharge capacity, good capacity retention, and long cycle life.
IT **12026-04-9**, **Nickel hydroxide oxide** (**NiOOH**)
(cathode contg. .gamma.-**NiOOH** particles coated with elec. conductive metal for alk. **battery** for discharge capacity)
RN 12026-04-9 HCA
CN Nickel hydroxide oxide (Ni(OH)O) (9CI) (CA INDEX NAME)

HO—Ni═O

IT **7440-57-5**, **Gold**, uses
(.gamma.-**NiOOH** particle-contg. cathode coated with elec. conductive metal for alk. **battery** for discharge capacity)
RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **Battery** cathodes
(cathode contg. .gamma.-**NiOOH** particles coated with elec. conductive metal for alk. **battery** for discharge capacity)
IT Coating materials
(elec. conductive; cathode contg. .gamma.-**NiOOH** particles coated with elec. conductive metal for alk. **battery** for discharge capacity)
IT 7440-22-4, Silver, uses 7440-50-8, Copper, uses **12026-04-9**, **Nickel hydroxide oxide** (**NiOOH**)
(cathode contg. .gamma.-**NiOOH** particles coated with elec. conductive metal for alk. **battery** for discharge capacity)
IT 7439-88-5, Iridium, uses 7440-02-0, Nickel, uses 7440-05-3,

Palladium, uses 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-36-0, Antimony, uses 7440-48-4, Cobalt, uses **7440-57-5**, **Gold**, uses 7440-66-6, Zinc, uses 7440-74-6, Indium, uses 11101-13-6
(.gamma.-**NiOOH** particle-contg. cathode coated with elec. conductive metal for alk. **battery** for discharge capacity)

L24 ANSWER 7 OF 13 HCA COPYRIGHT 2003 ACS on STN
130:156030 Electrochemical behavior of nickel deposited on reticulated vitreous carbon. Czerwinski, A.; Dmochowska, M.; Grden, M.; Kopczyk, M.; Wojcik, G.; Mlynarek, G.; Kolata, J.; Skowronski, J. M. (Department of Chemistry, The University of Warsaw, Warsaw, 02-093, Pol.). Journal of Power Sources, 77(1), 28-33 (English) 1999. CODEN: JPSODZ. ISSN: 0378-7753. Publisher: Elsevier Science S.A..
AB The electrochem. performance of nickel deposited on reticulated vitreous carbon (RVC) has been investigated in solns. of KOH. For comparison, the study of sintered nickel and nickel deposited on **gold** wire behavior were also included. The results indicate that the RVC covered with nickel is a good carrier for Ni(OH)2/ **NiOOH** electrode material used in rechargeable **batteries**. Ni/RVC satd. with Ni(OH)2 shows behavior similar or even better than that of sintered Ni satd. with Ni(OH)2.
IT **Battery** cathodes
(electrochem. behavior of nickel deposited on reticulated vitreous carbon for use as cathode in **batteries**)
IT 7440-02-0, Nickel, uses
(electrochem. behavior of nickel deposited on reticulated vitreous carbon for use as cathode in **batteries**)
IT 1310-58-3, Potassium hydroxide, uses
(electrolyte; electrochem. behavior of nickel deposited on reticulated vitreous carbon for use as cathode in **batteries**)
IT 7440-44-0, Carbon, uses
(reticulated vitreous; electrochem. behavior of nickel deposited on reticulated vitreous carbon for use as cathode in **batteries**)

L24 ANSWER 8 OF 13 HCA COPYRIGHT 2003 ACS on STN
129:167240 Thermodynamic considerations of the reversible potential for the nickel electrode. Jain, Mukul; Elmore, Amanda L.; Matthews, Michael A.; Weidner, John W. (Dep. Chem. Eng., Swearingen Eng. Center, Univ. South Carolina, Columbia, SC, 29208, USA). Electrochimica Acta, 43(18), 2649-2660 (English) 1998. CODEN: ELCAAV. ISSN: 0013-4686. Publisher: Elsevier Science Ltd..
AB The thermodn. of ideal and non-ideal solns. is applied to nickel hydroxide, the electrochem. active material in the pos. electrode of a nickel **battery**, to provide theor. insight into the reversible potential as a function of the state-of-discharge. The models were fit to exptl. discharge curves to obtain the activity-coeff. parameters and the std. potential over a temp. range

from 5 to 55.degree.. The two-parameter activity coeff. models perform significantly better than the protons into the lattice occurs in an ordered, non-random fashion. The std. potential decreases linearly with temp. by 0.84 mV/K. The thermodn. expressions and parameters given here enable one to predict the reversible potential of nickel hydroxide as a function of temp. and state-of-discharge.

IT **7440-57-5, Gold**, uses
(substrate for nickel hydroxide electrochem. deposition)
RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT Electric charge
(exptl. and model discharge curves for nickel hydroxide over temp. range from 5 to 550)
IT Cyclic voltammetry
(of nickel hydroxide electrode in KOH electrolyte)
IT Films
(of nickel hydroxide electrodeposition on **gold** substrate)
IT Thermodynamics
(of reversible potential for nickel electrode)
IT Activity (thermodynamic)
Electric potential
Redox reaction
Simulation and Modeling, physicochemical
Standard potential
(thermodn. considerations of reversible potential for nickel electrode)
IT Secondary **batteries**
(thermodn. considerations of reversible potential for nickel electrode in)
IT 1310-58-3, Potassium hydroxide, properties
(charge-discharge of nickel hydroxide film in soln. of)
IT 21041-93-0, Cobalt hydroxide (Co(OH)2)
(copptn. of, in nickel hydroxide **battery** electrode)
IT 12054-48-7, Nickel hydroxide 55070-72-9, **Nickel hydroxide oxide**
(electrode; reversible potential and thermodn. considerations)
IT 10141-05-6, Cobalt nitrate
(electrolytic bath for nickel film deposition contg.)
IT 64-17-5, Ethanol, uses 7631-99-4, Sodium nitrate, uses
(electrolytic bath for nickel hydroxide film deposition contg.)
IT **7440-57-5, Gold**, uses
(substrate for nickel hydroxide electrochem. deposition)
IT 7440-02-0, Nickel, uses
(thermodn. considerations of reversible potential for nickel electrode)

L24 ANSWER 9 OF 13 HCA COPYRIGHT 2003 ACS on STN
117:11406 Studies on the self-discharge mechanism of nickel/hydrogen cells. Lim, Hong S.; Rogers, Howard H.; Losee, David B. (Ind. Electron. Group, Hughes Aircr. Co., Torrance, CA, 90509-2999, USA). Proceedings - Electrochemical Society, 92-5(Proc. Symp. Hydrogen Storage Mater., Batteries, Electrochem., 1991), 333-43 (English) 1992. CODEN: PESODO. ISSN: 0161-6374.

AB The self-discharge of Ni/H **batteries** involves either a direct chem. reaction between charged active material and H or the electrochem. oxidn. of H at the surface of **NiOOH** active material. The H oxidn. rate at **NiOOH** is partially limited by diffusion. The use of porous Ni or **Au** electrode did grid X not promote self-discharge. The ~~H pressure~~ changes obsd. under open-circuit storage conditions were much smaller than the obsd. self-discharge current and, in some cases, the direction of current changes was not the same as that of pressure changes; this observation rules out the direct reaction of H as the cause for self-discharge.

IT **12026-04-9, Nickel hydroxide oxide (NiOOH)**
(oxidn. at, of hydrogen, nickel-hydrogen **battery** self-discharge due to)

RN 12026-04-9 HCA

CN Nickel hydroxide oxide (Ni(OH)O) (9CI) (CA INDEX NAME)

HO—Ni=O

IT **Batteries**, secondary
(nickel-hydrogen, self-discharge mechanism of)

IT **12026-04-9, Nickel hydroxide oxide (NiOOH)**
(oxidn. at, of hydrogen, nickel-hydrogen **battery** self-discharge due to)

IT 1333-74-0, Hydrogen, reactions
(oxidn. of, at **nickel hydroxide oxide** active material, nickel-hydrogen **battery** self-discharge due to)

L24 ANSWER 10 OF 13 HCA COPYRIGHT 2003 ACS on STN
112:187861 Hydrogen oxidation on nickel electrodes in alkaline media. Zhang, C.; White, R. E.; Kim, J. B.; Appleby, A. J.; Srinivasan, S. (Dep. Chem. Eng., Texas A and M Univ., College Station, TX, 77843-3122, USA). Proceedings - Electrochemical Society, 90-4(Proc. Symp. Nickel Hydroxide Electrodes, 1989), 356-67 (English) 1990. CODEN: PESODO. ISSN: 0161-6374.

AB Hydrogen oxidn. on Pt, **Au** and Ni in alk. media was studied using cyclic voltammetry, rotating disk electrode and potentiostatic techniques, in an effort to understand the self-discharge mechanism of the Ni/H2 **battery**. The Ni substrate was found to be the most effective in inhibiting hydrogen oxidn. The anodically formed **nickel** hydroxide/**oxyhydroxide** film

exhibits a better inhibiting character than that cathodically formed in respect to hydrogen oxidn., and it may play an important role in minimizing self-discharge.

IT **7440-57-5**, **Gold**, uses and miscellaneous
(electrode, hydrogen oxidn. on, in alk. medium)

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **12026-04-9**, **Nickel hydroxide oxide** (**Ni**(**OH**)**O**)
(nickel electrode coated with, hydrogen oxidn. on)

RN 12026-04-9 HCA

CN Nickel hydroxide oxide (Ni(OH)O) (9CI) (CA INDEX NAME)

HO—Ni═O

IT Oxidation, electrochemical
(of hydrogen, on nickel, passivation effect on)

IT Oxidation catalysts
(electrochem., neg., **nickel oxyhydroxide**, for hydrogen)

IT Passivation
(electrochem., of nickel, hydrogen oxidn. in relation to)

IT **7440-57-5**, **Gold**, uses and miscellaneous
(electrode, hydrogen oxidn. on, in alk. medium)

IT 7440-02-0, Nickel, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous
(electrode, hydrogen oxidn. on, passivation effect on)

IT **12026-04-9**, **Nickel hydroxide oxide** (**Ni**(**OH**)**O**) 12054-48-7, Nickel dihydroxide
(nickel electrode coated with, hydrogen oxidn. on)

IT 1333-74-0, Hydrogen, reactions
(oxidn. of, electrochem., on **gold** or nickel or platinum)

L24 ANSWER 11 OF 13 HCA COPYRIGHT 2003 ACS on STN

98:37599 Cathodic hydrogen gas production through palladium alloy membrane electrodes. Shirogami, T.; Murata, K. (Toshiba Res. Dev. Cent., Kawasaki, Japan). International Journal of Hydrogen Energy, 7(11), 877-82 (English) 1982. CODEN: IJHEDX. ISSN: 0360-3199.

AB A H-permeable membrane electrode-H-**NiOOH** rechargeable **battery** was tested and the performance of the cathodic H prodn. through the membrane electrode was investigated. A Pd-13.4 Ag-20% **Au** **[39285-07-9]** alloy membrane electrode, whose 1 surface was covered with Pd-Pt black catalyst and the other with Pd black, was used to make 1 of the walls of the H-contg. vessel. When the Pd-Pt catalyzed electrolyte-facing

surface is cathodically polarized in concd. KOH solns., H atoms dissolve in the membrane by penetrating it and leave the other palladized surface as free H, which passes into the gas chamber. The effects of electrode potential, H pressure in the gas chamber, membrane thickness, electrolyte concn., and temp. on the H prodn. rate and yield into the gas chamber were investigated and a refined anal. of the the phenomena was carried out.

IT **39285-07-9**
(electrodes, catalytic membrane, **battery**, performance of hydrogen)

RN 39285-07-9 HCA

CN Palladium alloy, base, Pd 67,Au 20,Ag 13 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Pd | 67 | 7440-05-3 |
| Au | 20 | 7440-57-5 |
| Ag | 13 | 7440-22-4 |

IT **Batteries**, secondary
(nickel-hydrogen, performance of)

IT Electrodes
(**battery**, catalytic, membrane, **gold** -palladium-silver alloy, performance of hydrogen)

IT 1333-74-0, uses and miscellaneous
(electrodes, **battery**, **gold**-palladium-silver alloy membrane, performance of catalytic)

IT **39285-07-9**
(electrodes, catalytic membrane, **battery**, performance of hydrogen)

L24 ANSWER 12 OF 13 HCA COPYRIGHT 2003 ACS on STN

95:118372 Cathodic hydrogen gas production through palladium alloy membrane electrodes. Shirogami, T.; Murata, K. (Toshiba Res. Dev. Cent., Kawasaki, Japan). Advances in Hydrogen Energy, 2(Hydrogen Energy Prog., Vol. 4), 2055-65 (English) 1981. CODEN: AHENDB. ISSN: 0276-2412.

AB A H-**Ni(OH)O** secondary **battery** having a H-permeable membrane anode was tested and performance of the anode was investigated. The Pd-13.4 Ag-20% **Au** alloy [**39285-07-9**] anode, whose 1 surface was covered with Pd-Pt black catalyst and the other with Pd black, was used to make a wall of a H-contg. vessel. When the Pd-Pt catalyzed electrolyte-facing surface is polarized in concd. KOH, H is yielded into the chamber through the dissolved H atoms penetrating the membrane and leaving at the other palladized surface as H. Effects of electrode potential, H pressure in the gas chamber, membrane thickness, electrolyte concn., and exptl. temp. on H prodn. rate and yield efficiency were investigated and analyzed.

IT **39285-07-9**
(anodes from hydrogen-permeable, **battery**, performance

of)
RN 39285-07-9 HCA
CN Palladium alloy, base, Pd 67,Au 20,Ag 13 (9CI) (CA INDEX NAME)

| Component | Component Percent | Component Registry Number |
|---|---|---|
| Pd | 67 | 7440-05-3 |
| Au | 20 | 7440-57-5 |
| Ag | 13 | 7440-22-4 |

IT **Batteries**, secondary
(hydrogen-**nickel hydroxide oxide**, performance of)
IT Anodes
(**battery**, hydrogen-permeable **gold** -palladium-silver alloy, performance of)
IT 1333-74-0, uses and miscellaneous
(anodes from **gold**-palladium-silver alloy permeable by, **battery**, performance of)
IT **39285-07-9**
(anodes from hydrogen-permeable, **battery**, performance of)

L24 ANSWER 13 OF 13 HCA 
93:242748 Nickel-oxide electrode structure. Oswin, Harry G. (USA). U.S. US 4224392 19800923, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1977-861421 19771216.
AB Ni oxide electrode structures esp. suitable for use in mobile energy-storage applications comprise a highly porous C matrix having electrochem. active **Ni(OH)O** deposited within and in elec. contact with the matrix sandwiched between 2 thin rigid Mg supports. The surface of the support in contact with the matrix can be coated with a metal such as **Au** to provide elec. cond. The electrodes are economically manufd. to provide a thick electrode having high porosity and large pore size while maintaining structural strength and stability, and including a large amt. of active mass.
IT **7440-57-5**, uses and miscellaneous
(electrodes contg. coating of, **nickel hydroxide oxide battery**, of high capcity and strength)
RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **12026-04-9**
(electrodes, **battery**, of high capacity and strength)
RN 12026-04-9 HCA
CN Nickel hydroxide oxide (Ni(OH)O) (9CI) (CA INDEX NAME)

$HO-Ni=O$

IT Electrodes
(**battery**, **nickel hydroxide**
**oxide**, of high capacity and strength)
IT **7440-57-5**, uses and miscellaneous
(electrodes contg. coating of, **nickel hydroxide**
**oxide battery**, of high capcity and strength)
IT 7440-44-0, uses and miscellaneous
(electrodes contg. matrix of, **nickel hydroxide**
**oxide battery**, of high capacity and strength)
IT 7439-95-4, uses and miscellaneous
(electrodes contg. supports of, **nickel**
**hydroxide oxide battery**, of high
capacity and strength)
IT **12026-04-9**
(electrodes, **battery**, of high capacity and strength)